

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An exhaust gas purifying system comprising:

a NOx treating catalyst for reducing NOx disposed in an exhaust gas passageway of a combustion device, to reduce NOx in presence of reducing components in exhaust gas; and

a hydrogen enriching device disposed upstream of said NOx treating catalyst with respect to flow of exhaust gas from the combustion device and arranged to increase a ratio of hydrogen to total reducing components in at least one of combustion gas and or exhaust gas so as to meet relations represented by following formulae (1) and (2), when reduction of NOx is carried out by said NOx treating catalyst:

$$[\text{H}_2 / \text{TR}]_d > [\text{H}_2 / \text{TR}]_u \dots (1)$$

$$[\text{H}_2 / \text{TR}]_d \geq 0.3 \dots (2)$$

where $[\text{H}_2 / \text{TR}]_u$ is a ratio between a concentration $[\text{H}_2]_u$ of hydrogen and a concentration $[\text{TR}]_u$ of total reducing components in at least one of exhaust gas in the exhaust gas passageway upstream of said hydrogen enriching device and or combustion gas in a state before undergoing the hydrogen ratio increasing by said hydrogen enriching device; and $[\text{H}_2 / \text{TR}]_d$ is a ratio between a concentration $[\text{H}_2]_d$ of hydrogen and a concentration $[\text{TR}]_d$ of total reducing components in exhaust gas in the exhaust gas passageway upstream of the NOx treating catalyst and downstream of said hydrogen enriching device,

wherein said hydrogen enriching device is at least one selected from the group consisting of a device for producing hydrogen in at least one of combustion gas and or exhaust gas, a device for decreasing the reducing components other than hydrogen in at least one of combustion gas and or exhaust gas, and a device for suppressing consumption of hydrogen in at least one of combustion gas and or exhaust gas, ~~wherein the device for producing hydrogen in at least one of combustion gas and exhaust gas includes at least a~~

~~hydrogen producing catalyst containing at least one noble metal, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas and exhaust gas flowing into the hydrogen producing catalyst wherein said hydrogen enriching device includes a catalyst containing at least one of a first catalytic component including platinum and zirconium oxide or a second catalytic component including rhodium and zirconium oxide, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection amount, fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas or exhaust gas flowing into the catalyst,~~

wherein said hydrogen enriching device is arranged to increase a ratio of hydrogen to carbon monoxide in the total reducing components in exhaust gas so as to meet a relation represented by the following formula $[H_2 / CO]_d > 1$ where $[H_2 / CO]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[CO]_d$ of carbon monoxide in the total reducing components in exhaust gas in the exhaust gas passageway immediately upstream of the NOx treating catalyst and downstream of said hydrogen enriching device, when reduction of NOx is carried out by said NOx treating catalyst.

2-4. (Canceled)

5. (Currently Amended) An exhaust gas purifying system as claimed in claim 1, wherein the device for decreasing the reducing components other than hydrogen in at least one of combustion gas and exhaust gas includes a CO and HC selective oxidation catalyst containing zirconium oxide, for selectively oxidizing CO and HC.

6. (Currently Amended) An exhaust gas purifying system as claimed in claim 1, wherein the device for suppressing consumption of hydrogen in at least one of combustion gas and or exhaust gas is a catalyst containing solid acid zirconium oxide.

7. (Withdrawn - Currently Amended) An exhaust gas purifying system comprising:

a NOx treating catalyst for reducing NOx disposed in an exhaust gas passageway of a combustion device, to reduce NOx in presence of reducing components in exhaust gas; and

a hydrogen enriching device disposed upstream of said NOx treating catalyst with respect to flow of exhaust gas from the combustion device and arranged to increase a ratio of hydrogen to total reducing components in at least one of combustion gas and or exhaust gas so as to meet relations represented by following formulae (1) and (2), when reduction of NOx is carried out by said NOx treating catalyst:

$$[\text{H}_2 / \text{TR}]_d > [\text{H}_2 / \text{TR}]_u \dots (1)$$

$$[\text{H}_2 / \text{TR}]_d \geq 0.3 \dots (2)$$

where $[\text{H}_2 / \text{TR}]_u$ is a ratio between a concentration $[\text{H}_2]_u$ of hydrogen and a concentration $[\text{TR}]_u$ of total reducing components in at least one of exhaust gas in the exhaust gas passageway upstream of said hydrogen enriching device and or combustion gas in a state before undergoing the hydrogen ratio increasing by said hydrogen enriching device; and $[\text{H}_2 / \text{TR}]_d$ is a ratio between a concentration $[\text{H}_2]_d$ of hydrogen and a concentration $[\text{TR}]_d$ of total reducing components in exhaust gas in the exhaust gas passageway upstream of the NOx treating catalyst and downstream of said hydrogen enriching device,

wherein the hydrogen enriching device is a device for introducing hydrogen into at least one of combustion gas and or exhaust gas and for supplying hydrogen-contained gas

produced by using hydrocarbon fuel and air, from outside of the exhaust passageway, and wherein the hydrogen contained gas is produced in the combustion device.

8. (Withdrawn) An exhaust gas purifying system as claimed in Claim 7, wherein the device for supplying hydrogen-contained gas includes a hydrogen-contained gas producing catalyst for promoting reaction for producing hydrogen-contained gas from the hydrocarbon fuel, and a device for supplying the hydrocarbon fuel and air to the catalyst.

9. (Withdrawn) An exhaust gas purifying system as claimed in Claim 8, wherein the hydrogen-contained gas supply device further includes an oxygen concentration sensor disposed upstream of the hydrogen-contained gas producing catalyst so as to detect a concentration of oxygen, and a temperature sensor disposed downstream of the hydrogen-contained gas producing catalyst so as to detect a temperature of the hydrogen-contained gas producing catalyst, wherein amounts of hydrocarbon fuel and air to be supplied to the hydrogen-contained gas producing catalyst are controlled in accordance with the temperature of the hydrogen-contained gas producing catalyst.

10. (Withdrawn) An exhaust gas purifying system as claimed in Claim 8, wherein the hydrogen-contained gas supply device includes a device for decreasing the amount of hydrocarbon fuel to be supplied and increasing the amount of air to be supplied so as to increase a concentration of oxygen, when the temperature of the hydrogen-contained gas producing catalyst is lower than a level.

11. (Canceled)

12. (Withdrawn) An exhaust gas purifying system as claimed Claim 7, wherein the hydrogen-contained gas supply device includes a device for temporarily storing hydrogen-contained gas which has been produced, before being supplied to said NOx treating catalyst.

13. (Withdrawn – Currently Amended) An exhaust gas purifying system of a multiple step control type in combination with an internal combustion engine having an exhaust gas passageway,

said engine including a combustion system having a combustion control device for controlling at least one selected from the group consisting of operating parameters of the engine and combinations of the operating parameters, the operating parameters including fuel injection timing, spark timing, opening and closing timing of intake and exhaust valves of the engine;

said exhaust gas purifying system including

a NOx treating catalyst for reducing NOx disposed in the exhaust gas passageway to reduce NOx in presence of reducing components in exhaust gas, and

a hydrogen enriching device disposed upstream of said NOx treating catalyst with respect to flow of exhaust gas and including at least one selected from the group consisting of a hydrogen producing catalyst containing at least one noble metal, a CO and HC selective oxidation catalyst containing zirconium oxide, a catalyst containing solid acid zirconium oxide, and a device for supplying hydrogen-contained gas produced by using hydrocarbon fuel and air, from outside of the exhaust passageway, said hydrogen-contained gas supplying device including at least one of a first hydrogen-contained gas supplying device having a hydrogen-contained gas producing catalyst for promoting reaction for producing hydrogen-contained gas from the hydrocarbon fuel, and a device for supplying the hydrocarbon fuel and air to the catalyst, and or a second hydrogen-contained gas supplying device for producing hydrogen-contained gas by using hydrocarbon fuel and exhaust gas under heat,

said hydrogen enriching device being arranged to increase a ratio of hydrogen to total reducing components in at least one of combustion gas and exhaust gas so as to meet relations represented by the following formulae (1) and (2), when reduction to NOx is carried out by said NOx treating catalyst:

$$[\text{H}_2 / \text{TR}]_d > [\text{H}_2 / \text{TR}]_u \dots (1)$$

$$[\text{H}_2 / \text{TR}]_d \geq 0.3 \dots (2)$$

where $[\text{H}_2 / \text{TR}]_u$ is a ratio between a concentration $[\text{H}_2]_u$ of hydrogen and a concentration $[\text{TR}]_u$ of total reducing components in at least one of exhaust gas in the exhaust

gas passageway upstream of said hydrogen enriching device and or combustion gas in a state before undergoing the hydrogen ratio increasing by said hydrogen enriching device; and $[H_2/TR]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and concentration $[TR]_d$ of total reducing components in exhaust gas in the exhaust gas passageway upstream of the NO_x treating catalyst and downstream of said hydrogen enriching device, and wherein the hydrogen enriching device produces hydrogen in the engine.

14. (Withdrawn) An exhaust gas purifying system as claimed in Claim 13, wherein said hydrogen enriching device is arranged to increase a ratio of hydrogen to carbon monoxide in the total reducing components in exhaust gas so as to meet a relation represented by the following formula of $[H_2 / CO]_d > 1$ where $[H_2 / CO]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[CO]_d$ of carbon monoxide in the total reducing components in exhaust gas in the exhaust gas passageway immediately upstream of the NO_x treating catalyst and downstream of said hydrogen enriching device, when reduction of NO_x is carried out by said NO_x treating catalyst.

15. (Original) An exhaust gas purifying system as claimed in Claim 5, wherein the CO and HC selective oxidation catalyst has a function of producing hydrogen and contains rhodium and zirconium oxide, the zirconium oxide containing alkaline earth metal and having a composition represented by the following general formula (3):



where X is an alkaline earth metal selected from the group consisting of magnesium, calcium, strontium and barium; a and b are ratios of atoms of elements; and c is a number of oxygen atoms required for satisfying valences of X and Zr, in which a is within a range of from 0.01 to 0.5, b is within a range of from 0.5 to 0.99, and $a + b = 1.0$.

16. (Previously Presented) An exhaust gas purifying system as claimed in Claim 15, wherein the CO and HC selective oxidation catalyst further contains palladium and cerium oxide, the palladium being carried in an amount ranging from 20 to 80 % by weight of total palladium on cerium oxide.

17. (Previously Presented) An exhaust gas purifying system as claimed in Claim 6, wherein the catalyst containing solid acidic zirconium oxide contains platinum, the solid acidic zirconium oxide containing at least one element selected from the group consisting of titanium, aluminum, tungsten, molybdenum and zinc, the solid acidic zirconium oxide having a composition represented by the following general formula (4):



where Y is at least one element selected from the group consisting of titanium, aluminum, tungsten, molybdenum and zinc; d and e are ratios of atoms of elements; and f is a number of oxygen atoms required for satisfying valences of Y and Zr, in which d is within a range of from 0.01 to 0.5, e is within a range of from 0.5 to 0.99, and $d+e = 1.0$.

18. (Currently Amended) An exhaust gas purifying system as claimed in claim 1, wherein the hydrogen producing catalyst has a function to produce hydrogen from HC and CO in at least one of combustion gas and or exhaust gas.

19. (Currently Amended) An exhaust gas purifying system comprising:

a NOx treating catalyst for reducing NOx disposed in an exhaust gas passageway of a combustion device, to reduce NOx in presence of reducing components in exhaust gas; and

a hydrogen enriching device disposed upstream of said NOx treating catalyst with respect to flow of exhaust gas from the combustion device and arranged to increase a ratio of hydrogen to total reducing components in at least one of combustion gas and exhaust gas so as to meet relations represented by following formulae (1) and (2), when reduction of NOx is carried out by said NOx treating catalyst:

$$[H_2 / TR]d > [H_2 / TR]u \quad \dots (1)$$

$$[H_2 / TR]d \geq 0.3 \quad \dots (2)$$

where $[H_2 / TR]u$ is a ratio between a concentration $[H_2]u$ of hydrogen and a concentration $[TR]u$ of total reducing components in at least one of exhaust gas in the exhaust gas passageway upstream of said hydrogen enriching device and or combustion gas in a state

before undergoing the hydrogen ratio increasing by said hydrogen enriching device; and [H₂ / TR]d is a ratio between a concentration [H₂]d of hydrogen and a concentration [TR]d of total reducing components in exhaust gas in the exhaust gas passageway upstream of the NO_x treating catalyst and downstream of said hydrogen enriching device,

wherein said hydrogen enriching device is a device for producing hydrogen in at least one of combustion gas and or exhaust gas and includes a hydrogen producing catalyst containing at least one noble metal, wherein the hydrogen producing catalyst has a function to produce hydrogen from HC and CO in at least one of combustion gas and or exhaust gas, and

wherein the hydrogen producing catalyst includes a first catalytic component for oxidizing HC and CO to decrease oxygen, said first catalytic component being disposed in a first section of the hydrogen producing catalyst, and a second catalytic component for producing hydrogen and disposed in a second section of the hydrogen producing catalyst, the second section being located downstream of the first section with respect to flow of exhaust gas, so that an amount of oxygen to be contacted with the second catalytic component is decreased.

20. (Currently Amended) An exhaust gas purifying system as claimed in Claim 19, wherein the first catalytic component includes at least one of palladium, and platinum and or alumina, at least one of palladium and or platinum being contained in an amount ranging from 0.1 to 50 g per one liter of a carrier.

21. (Original) An exhaust gas purifying system as claimed in Claim 19, wherein the second catalytic component includes rhodium and zirconium oxide, rhodium being contained in an amount ranging from 0.1 to 50 g per one litter of a carrier, zirconium oxide being contained in an amount ranging from 10 to 300 g per one liter of the carrier.

22. (Original) An exhaust gas purifying system as claimed in Claim 21, wherein the zirconium oxide contains alkaline earth metal and has a composition represented by the following general formula (3):

[X]_aZr_bO_c... (3)

where X is an alkaline earth metal selected from the group consisting of magnesium, calcium, strontium and barium; a and b are ratios of atoms of elements; and c is a number of oxygen atoms required for satisfying valences of X and Zr, in which a is within a range of from 0.01 to 0.5, b is within a range of from 0.5 to 0.99, and a + b = 1.0.

23. (Previously Presented) An exhaust gas purifying system as claimed in Claim 18, further comprising a device for controlling exhaust gas at a position upstream of the hydrogen producing catalyst to intermittently have a composition in which air-fuel ratio is rich, so as to raise efficiency of production of hydrogen by the hydrogen producing catalyst.

24. (Original) An exhaust gas purifying system as claimed in Claim 1, wherein said NO_x treating catalyst contains at least one noble metal selected from the group consisting of platinum, palladium and rhodium, and at least one substance selected from the group consisting of alumina, alkali metal and alkaline earth metal.

25. (Original) An exhaust gas purifying system as claimed Claim 1, wherein said NO_x treating catalyst contains at least rhodium and arranged to be capable of reducing NO_x in exhaust gas at a temperature ranging from 260 to 380 °C.

26. (Original) An exhaust gas purifying system as claimed in Claim 1, wherein said combustion device is an internal combustion engine.

27. (Original) An exhaust gas purifying system as claimed in Claim 1, wherein the internal combustion engine is a gasoline-fueled engine for an automotive vehicle.

28. (Currently Amended) An exhaust gas purifying system comprising:

a NO_x treating catalyst for reducing NO_x disposed in an exhaust gas passageway of a combustion device, to reduce NO_x in presence of reducing components in exhaust gas; and

means for enriching hydrogen disposed upstream of said NO_x treating catalyst with respect to flow of exhaust gas from the combustion device, said hydrogen enriching means is for increasing a ratio of hydrogen to total reducing components in at least one of combustion

gas and or exhaust gas so as to meet relations represented by the following formulae (1) and (2), when reduction of NOx is carried out by said NOx treating catalyst:

$$[H_2/TR]_d > [H_2/TR]_u \dots (1)$$

$$[H_2 / TR]_d \geq 0.3 \dots (2)$$

where $[H_2 / TR]_u$ is a ratio between a concentration $[H_2]_u$ of hydrogen and a concentration $[TR]_u$ of total reducing components in at least one of exhaust gas in the exhaust gas passageway upstream of said hydrogen enriching device and or combustion gas in a state before undergoing the hydrogen ratio increasing by said hydrogen enriching means; and $[H_2 / TR]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[TR]_d$ of total reducing components in exhaust gas in the exhaust gas passageway upstream of the NOx treating catalyst and downstream of said hydrogen enriching means,

wherein said means for enriching hydrogen is at least one selected from the group consisting of a means for producing hydrogen in at least one of combustion gas and or exhaust gas, a means for decreasing the reducing components other than hydrogen in at least one of combustion gas and or exhaust gas, and a means for suppressing consumption of hydrogen in at least one of combustion gas and or exhaust gas, ~~wherein the means for producing hydrogen in at least one of combustion gas and exhaust gas includes at least a hydrogen producing catalyst containing at least one noble metal, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas and exhaust gas flowing into the hydrogen producing catalyst~~ wherein said means for enriching hydrogen includes a catalyst containing at least one of a first catalytic component including platinum and zirconium oxide or a second catalytic component including rhodium and zirconium oxide, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection

amount, fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas or exhaust gas flowing into the catalyst,

wherein said means for enriching hydrogen is arranged to increase a ratio of hydrogen to carbon monoxide in the total reducing components in exhaust gas so as to meet a relation represented by the following formula $[H_2 / CO]_d > 1$ where $[H_2 / CO]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[CO]_d$ of carbon monoxide in the total reducing components in exhaust gas in the exhaust gas passageway immediately upstream of the NOx treating catalyst and downstream of said means for enriching hydrogen, when reduction of NOx is carried out by said NOx treating catalyst.

29. (Currently Amended) A method of purifying exhaust gas from a combustion device provided with an exhaust gas purifying system including a NOx treating disposed in an exhaust gas passageway of the combustion device, a NOx treating catalyst reducing NOx in presence of reducing components in exhaust gas, said method comprising:

increasing a ratio of hydrogen to total reducing components in at least one of combustion gas and or exhaust gas to be supplied to the NOx treating catalyst so as to meet relations represented by the following formulae (1) and (2), when reduction of NOx is carried out by said NOx treating catalyst:

$$[H_2 / TR]_d > [H_2 / TR]_u \dots (1)$$

$$[H_2 / TR]_d \geq 0.3 \dots (2)$$

where $[H_2 / TR]_u$ is a ratio between a concentration $[H_2]_u$ of hydrogen and a concentration $[TR]_u$ of total reducing components in at least one of exhaust gas in the exhaust gas passageway upstream of said hydrogen enriching and or combustion gas in a state before undergoing the hydrogen ratio increasing; and $[H_2 / TR]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[TR]_d$ of total reducing components in exhaust gas in the exhaust gas passageway upstream of the NOx treating catalyst and in a state after undergoing the hydrogen ratio increasing,

wherein said ratio of hydrogen to total reducing components is increased by at least one selected from the group consisting of producing hydrogen in at least one of combustion gas ~~and or~~ exhaust gas, decreasing the reducing components other than hydrogen in at least one of combustion gas ~~and or~~ exhaust gas, and suppressing consumption of hydrogen in at least one of combustion gas ~~and or~~ exhaust gas, ~~wherein producing hydrogen in at least one of combustion gas and exhaust gas is produced by a device including at least a hydrogen producing catalyst containing at least one noble metal, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas and exhaust gas flowing into the hydrogen producing catalyst wherein increasing said ratio of hydrogen to total reducing components is carried out by a device including a catalyst containing at least one of a first catalytic component including platinum and zirconium oxide or a second catalytic component including rhodium and zirconium oxide, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection amount, fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas or exhaust gas flowing into the catalyst; and~~

~~increasing a ratio of hydrogen to carbon monoxide in the total reducing components in exhaust gas so as to meet a relation represented by the following formula $[H_2 / CO]_d > 1$ where $[H_2 / CO]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[CO]_d$ of carbon monoxide in the total reducing components in exhaust gas in the exhaust gas passageway immediately upstream of the NO_x treating catalyst and downstream of said device including a catalyst, when reduction of NO_x is carried out by said NO_x treating catalyst.~~

30. (Currently Amended) An exhaust gas purifying system comprising:

a NOx treating catalyst for reducing NOx disposed in an exhaust gas passageway of a combustion device, to reduce NOx in presence of reducing components in exhaust gas; and

a hydrogen enriching device disposed upstream of said NOx treating catalyst with respect to flow of exhaust gas from the combustion device and arranged to increase a ratio of hydrogen to total reducing components in at least one of combustion gas and or exhaust gas so as to meet relations represented by following formulae (1) and (2), when reduction of NOx is carried out by said NOx treating catalyst:

$$[H_2 / TR]_d > [H_2 / TR]_u \dots (1)$$

$$[H_2 / TR]_d \geq 0.3 \dots (2)$$

where $[H_2 / TR]_u$ is a ratio between a concentration $[H_2]_u$ of hydrogen and a concentration $[TR]_u$ of total reducing components in at least one of exhaust gas in the exhaust gas passageway upstream of said hydrogen enriching device and or combustion gas in a state before undergoing the hydrogen ratio increasing by said hydrogen enriching device; and $[H_2 / TR]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[TR]_d$ of total reducing components in exhaust gas in the exhaust gas passageway upstream of the NOx treating catalyst and downstream of said hydrogen enriching device,

~~wherein said hydrogen enriching device produces hydrogen out of at least one of combustion gas and exhaust gas, wherein the hydrogen enriching device includes at least a hydrogen producing catalyst containing at least one noble metal, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas and exhaust gas flowing into the hydrogen producing catalyst wherein said hydrogen enriching device includes a catalyst containing at least one of a first catalytic component including platinum and zirconium oxide or a second catalytic component including rhodium and zirconium oxide, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal~~

combustion engine and combinations of the operating parameters, the operating parameters including fuel injection amount, fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas or exhaust gas flowing into the catalyst,

wherein said hydrogen enriching device is arranged to increase a ratio of hydrogen to carbon monoxide in the total reducing components in exhaust gas so as to meet a relation represented by the following formula $[H_2 / CO]_d > 1$ where $[H_2 / CO]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[CO]_d$ of carbon monoxide in the total reducing components in exhaust gas in the exhaust gas passageway immediately upstream of the NOx treating catalyst and downstream of said hydrogen enriching device, when reduction of NOx is carried out by said NOx treating catalyst.

31. (Previously Presented) An exhaust gas purifying system as claimed in claim 30, wherein said hydrogen enriching device is a device for suppressing consumption of hydrogen in exhaust gas.

32. (Currently Amended) An exhaust gas purifying system as claimed in claim 30, wherein said hydrogen enriching device is a device for decreasing the reducing components other than hydrogen in at least one of combustion gas and or exhaust gas.

33. (Currently Amended) An exhaust gas purifying system comprising:

a NOx treating catalyst for reducing NOx disposed in an exhaust gas passageway of a combustion device, to reduce NOx in presence of reducing components in exhaust gas; and

a hydrogen enriching device disposed upstream of said NOx treating catalyst with respect to flow of exhaust gas from the combustion device and arranged to increase a ratio of hydrogen to total reducing components in at least one of combustion gas and or exhaust gas so as to meet relations represented by following formulae (1) and (2), when reduction of NOx is carried out by said NOx treating catalyst:

$$[H_2 / TR]_d > [H_2 / TR]_u \dots (1)$$

$$[H_2 / TR]_d \geq 0.3 \dots (2)$$

where $[H_2 / TR]_u$ is a ratio between a concentration $[H_2]_u$ of hydrogen and a concentration $[TR]_u$ of total reducing components in at least one of exhaust gas in the exhaust gas passageway upstream of said hydrogen enriching device and or combustion gas in a state before undergoing the hydrogen ratio increasing by said hydrogen enriching device; and $[H_2 / TR]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[TR]_d$ of total reducing components in exhaust gas in the exhaust gas passageway upstream of the NO_x treating catalyst and downstream of said hydrogen enriching device,

wherein the hydrogen enriching device produces hydrogen from HC and CO in at least one of combustion gas and or exhaust gas, wherein the hydrogen enriching device for enriching hydrogen in at least one of combustion gas and or exhaust gas includes at least a hydrogen producing catalyst containing at least one noble metal, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas and exhaust gas flowing into the hydrogen producing catalyst a catalyst containing at least one of a first catalytic component including platinum and zirconium oxide or a second catalytic component including rhodium and zirconium oxide, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection amount, fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas or exhaust gas flowing into the catalyst,

wherein said hydrogen enriching device is arranged to increase a ratio of hydrogen to carbon monoxide in the total reducing components in exhaust gas so as to meet a relation represented by the following formula $[H_2 / CO]_d > 1$ where $[H_2 / CO]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[CO]_d$ of carbon monoxide in the total reducing components in exhaust gas in the exhaust gas passageway immediately upstream of the NO_x treating catalyst and downstream of said hydrogen enriching device, when reduction of NO_x is carried out by said NO_x treating catalyst.

34. (Previously Presented) An exhaust gas purifying system as claimed in claim 33, wherein the hydrogen enriching device includes a first catalytic component for oxidizing HC and CO to decrease oxygen, said first catalytic component being disposed in a first section of the hydrogen enriching device, and a second catalytic component for producing hydrogen and disposed in a second section of the hydrogen enriching device, the second section being located downstream of the first section with respect to flow of exhaust gas, so that an amount of oxygen contacting the second catalytic component is decreased.

35. (Currently Amended) An exhaust gas purifying system comprising:

a NOx treating catalyst for reducing NOx disposed in an exhaust gas passageway of a combustion device, to reduce NOx in presence of reducing components in exhaust gas; and

a hydrogen enriching device disposed upstream of said NOx treating catalyst with respect to flow of exhaust gas from the combustion device and arranged to increase a ratio of hydrogen to total reducing components in at least one of combustion gas and or exhaust gas so as to meet relations represented by following formulae (1) and (2), when reduction of NOx is carried out by said NOx treating catalyst:

$$[\text{H2} / \text{TR}]_d > [\text{H2} / \text{TR}]_u \dots (1)$$

$$[\text{H2} / \text{TR}]_d \geq 0.3 \dots (2)$$

where $[\text{H2} / \text{TR}]_u$ is a ratio between a concentration $[\text{H2}]_u$ of hydrogen and a concentration $[\text{TR}]_u$ of total reducing components in at least one of exhaust gas in the exhaust gas passageway upstream of said hydrogen enriching device and or combustion gas in a state before undergoing the hydrogen ratio increasing by said hydrogen enriching device; and $[\text{H2} / \text{TR}]_d$ is a ratio between a concentration $[\text{H2}]_d$ of hydrogen and a concentration $[\text{TR}]_d$ of total reducing components in exhaust gas in the exhaust gas passageway upstream of the NOx treating catalyst and downstream of said hydrogen enriching device, and wherein both the NOx treating catalyst and the hydrogen enriching device are disposed in the exhaust passageway and wherein exhaust gas passes through the hydrogen enriching device, wherein the hydrogen enriching device includes at least a hydrogen producing catalyst containing at least one noble metal, and a combustion control device for controlling at least one selected

~~from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas and exhaust gas flowing into the hydrogen producing catalyst wherein the hydrogen enriching device includes a catalyst containing at least one of a first catalytic component including platinum and zirconium oxide or a second catalytic component including rhodium and zirconium oxide, and a combustion control device for controlling at least one selected from the group consisting of operating parameters of an internal combustion engine and combinations of the operating parameters, the operating parameters including fuel injection amount, fuel injection timing, spark timing, opening and closing timings of intake and exhaust valves of the internal combustion engine, to control at least one of combustion gas or exhaust gas flowing into the catalyst,~~

wherein said hydrogen enriching device is arranged to increase a ratio of hydrogen to carbon monoxide in the total reducing components in exhaust gas so as to meet a relation represented by the following formula $[H_2 / CO]_d > 1$ where $[H_2 / CO]_d$ is a ratio between a concentration $[H_2]_d$ of hydrogen and a concentration $[CO]_d$ of carbon monoxide in the total reducing components in exhaust gas in the exhaust gas passageway immediately upstream of the NO_x treating catalyst and downstream of said hydrogen enriching device, when reduction of NO_x is carried out by said NO_x treating catalyst.

36. (Cancelled).